



Planting Wildflowers on Private Property

HOW TO BUY A WILDFLOWER SEED MIX

Before purchasing a wildflower, seed mix answer the following questions:

1. Is the mix all annual, all perennial, or mixed? An all annual mix generally will not reseed itself enough to make a good show the next year. An all perennial mix will not flower profusely the first year. Annuals are generally more colorful than perennials.
2. What wildflower species are included in the mix and which of those are native or naturalized to the area where you live? Native and naturalized species will grow better in your area.
3. What percentage of the total mix does each species comprise? Is inexpensive bulk seed included as a high percentage of the mix? Some producers of wildflower mixes will vary the composition depending upon the availability of seeds. Often, mixtures contain an abundance of annuals, which provide a splash of color the first year. But a high percentage of non-native annuals do not re-seed the second year
4. What percentage of the material in the package is seed, and what percentage is inert material such as chaff, other plant parts, or other seeds?
5. What were the germination test results for each species? A lower germination rate indicates that more seed for that species needs to be included for a reasonable chance of producing a strong stand of flowers. Tests should have been conducted on the same seed lot and within the past six months. Ask the seed producer to provide this information.
6. What is the blooming season of the mix? The mix should offer species that bloom successively, for a long-lasting display. If everything blooms at the same time, you get a short blast of color and then weeds for the rest of the season.
7. What are the heights of the plants? Beds near the house are unusually best planted with plants that grow to a height of less than three feet. Tall plants are better suited to meadows.
8. Ask the grower to provide seeding rates for individual species and then ask how he determined the individual species rates when seeds were mixed.

Remember: not every species grows at every site. Buy the seed for the site you're planting.

WILDFLOWERS

SELECT SPECIES

CHOSEN FOR PERMANENCE, DURABILITY, AVAILABILITY AND COST

SPECIES NATIVE TO WEST VIRGINIA

COMMON NAME	ANNUAL PERENNIAL BIENNIAL	SCIENTIFIC NAME	GROWING SEASON	COLOR	HEIGHT
BUTTERFLY WEED	P	Asclepias tuberosa	June thru September	Orange	1' to 3'
COSMOS	A	Cosmos bipinnatus	July thru October	Pink - White	2' to 4'
LANCE LEAVED COREOPSIS	P	Coreopsis lanceolata	May thru August	Yellow	2'
CALLIOPSIS	A	Coreopsis tinctoria	June thru September	Yellow/Russet	1' to 3'
PURPLE CONEFLOWER	P	Echinacea purpurea	July thru September	Purple	2' to 3'
BLANKET FLOWER	P	Gaillardia aristata	June thru September	Yellow/Red	1' to 2'
BLAZING STAR	P	Liatris spicata	July thru September	Purple	2' to 3'
BLUE FLAX	P	Linum lewisii	June thru August	Blue	1' to 2'
PERENNIAL LUPINE	P	Lupinus perennis	June	Blue/White	1' to 2'
PRAIRIE CONEFLOWER	P	Ratihida columnaris	June thru August	Yellow	1' to 3'
BLACK-EYED SUSAN	B/P	Rudebeckia hirta	June thru August	Yellow/Brown	1' to 3'

NON-NATIVE SPECIES TOLERANT TO WEST VIRGINIA ENVIRONMENT

WHITE YARROW	P	Achillea millifolium	May thru September	White	2' to 3'
CORNFLOWER (Bachelors Button)	A	Centaurea cyanus	May thru August	Blue - Mixed	2'
WALLFLOWER	B/P	Cheiranthus alionii	May thru June	Orange	1' to 2'
OX-EYE DAISY	P	Chrysanthemum leuc	June thru July	WhiteYellow	1' to 2'
SWEET PEA	P	Lathyrus latifolius	June thru September	Pink (vine)	1' to 2'
MALTESE CROSS	P	Lychnis chalcedonica	June thru August	Red	1' to 2'
FLANDERS POPPY	A	Popaver rhoeas	May thru August	Red - Pink	1' to 2'
ORIENTAL POPPY	P	Popaver oriental	June thru September	Red	1' to 2'
CRIMSON CLOVER	A	Trifolium incarnatum	July thru August	Red	6"
1' CATCHFLY	A	Silene armeria	June thru August	Pink	1' to 2'

SUGGESTIONS FOR ESTABLISHING WILDFLOWERS FROM SEED

1) SEED SELECTION

A northeastern mixture will do best in West Virginia (this mix contains species native or naturalized to this area). You may buy a mixture of pure annuals at a much lower cost, but the site will need replanting the next year. Annuals bloom the first year while many perennials do not bloom until the second year, but will return year after year.

2) SITE EVALUATION

Most wildflower seed commercially available is suited for full sun to half day sun and well-drained soil (pH 6-7). Moderate fertility is fine. Very poor, sandy soil may show weak plants, sparse growth. Good loam may contain lots of weed seed and will grow everything abundantly, weeds and flowers alike. Heavy or very moist soils may require plants suitable for these conditions, however, seed of these species is scarce and often extremely expensive.

3) SITE PREPARATION

Evaluate existing vegetation. Grasses and perennial weeds must be eliminated before seeding wildflowers. A fast and effective method is to cut or mow a planting site as low as possible, then treat with systemic herbicide, i.e., ROUNDUP. Grasses and weeds should be herbicided when growth is green, not before growing or after growth has stopped in the fall. Sites should be allowed to stand untouched one to two weeks, and then a second coat of herbicide applied if necessary.

4) PLANTING METHOD

Seed should be hand broadcast, 'cyclone' seeded, or drilled mechanically, in furrows only. Do not cover with soil or mulch, instead, tamp or roll into the soil. General seeding rates are 10 to 20 pounds of flower seed per acre. (The WV Division of Highways currently plants seeds at a rate of 30 pounds per acre.)

5) PLANTING TIME

In West Virginia the ideal planting time is two to three weeks after the first fall frost. This usually occurs in late October or early November. Annual wildflower seed should be planted in late April or early May, however, the seed requires large amounts of moisture for germination. Perennial wildflower seed produces best results when exposed to the heavy moisture and continual freezing and thawing during the winter months. When planting in spring, the key to a good crop is - the earlier the better. Late spring and early Summer are usually dry months and are less conducive to good seed germination. If you decide to plant during this time do so in an area where regular watering is possible.

REMARKS You may expect the Northeastern Wildflower mix to start blooming in mid-May if planted in the fall, or seven to eight weeks after planting if sown in the spring. It is recommended that flowers be mowed at a height of no shorter than six inches after fall frost or after flowers have faded and gone to seed. If soil is acidic, a fall or spring application of lime will help species prosper. Perennial species will naturalize in the area and form clumps.

WILDFLOWER PLANTING INSTRUCTIONS FOR SMALL AREAS

1. Remove surface vegetation by scrapping it away with a shovel.
2. Rough soil surface with rake.
3. Mix wildflower seed with sand.
4. Spread sand and seed mixture evenly over planting surface.
5. Press seed & sand into soil by tamping down with a shovel or pressing it in with your feet.
6. Water liberally.
7. Keep well water until plants are established.

PREPARING A WEED INFESTED SITE

If past attempts to grow a wildflower meadow have failed, because invading grasses and weeds have grown faster and overtaken your intended planting site, it probably means there is a large amount of dormant weed seed in the soil. Unfortunately weed and grass seed can be buried for decades without germinating, yet, once it reaches the surface – as in tilling to plant wildflowers – it will germinate and grow as well as if it were only a day old! Thus, the young wildflowers are overwhelmed by the faster growing grass and weeds.

Following are some effective measures to help eliminate weed and grass seeds in heavily infested soil so that a more weed free wildflower planting can be cultivated.

1. If there is still plenty of growing season left in late summer or early fall, mow the site immediately. This cuts down some of the weeds while they are still blooming and have not yet produced seed.
2. As soon as the site is mowed, it should be thoroughly sprayed with a systemic herbicide. Wait one week for the herbicide to work and then rake the earth to loosen the top soil and expose any hidden weed seed.
3. Take advantage of whatever warm growing season is left in your area. Let the weed seeds that were not affected by the herbicide prosper. Even water them if you have dry weather. You are trying to sprout as many of the weed seeds on the surface of the soil as possible.
4. When new weeds are about two to three inches tall, kill them by applying a systemic herbicide. Most weeds should be dead within two weeks after herbiciding.
5. DO NOT TILL THE SOIL. Don't even rake it again. You will bring more dormant weed seed to the surface.
6. Now that the surface weeds are gone, you are ready to plant wildflowers. If there are at least two months of growing season left, any perennial mix may be sown on the prepared site. Quick germinating annuals should not be planted in the fall but in the spring. Remember, do not re-till. Just scatter the seed and with your feet or a roller.

You may either do a dormant planting in later autumn or early winter (after the first frost) or wait until warm weather returns in the spring. Perennials may be sown in fall or early winter, annuals should be planted in spring. When cold weather has returned to stay, but before the ground is frozen, the wildflower seed is dormant sown over the prepared site.

Contact with the cold soil will keep the perennial seed dormant and it will not sprout. Only after the ground is warm in the spring, when it is safe from killing frost, will the wildflower seed sprout. They will then grow and develop even faster than those planted in spring develop.

It is suggested that annual planting be done in the early spring after fear of frost has passed.

GUIDELINES FOR COLLECTING WILDFLOWER SEED

HOW AND WHERE TO COLLECT WILDFLOWER SEED

Collecting wildflower seed is done largely by hand because native species usually do not grow in pure stands. Also, topography often limits the use of mechanical equipment.

Tools and materials are determined by the size of the harvest. Basic equipment includes gloves, boots, drop cloths, pruning shears, boxes, baskets, paper or canvas bags (no plastic bags). Many plants can be stripped by hand, or the seeds can be beaten onto drop cloths. Screens with large openings are often used to sort seed or fruit from other plant's parts. This reduces the amount of plant material that must be dried before thrashing. Commercial operations use machines such as vacuum strippers, mechanical harvesters and tractor-drawn seed strippers to gather large quantities of seed.

Mark native plants during their flowering season, when they are most noticeable. This is an important step. Seldom will plants growing in the wild catch your attention when they are in fruit, and dried seed stalks are difficult to find. Use surveyors' flagging to mark individual plants. Record landmarks (e.g., six miles from town on U.S. 12 by an "Adopt-a-Highway" sign on the south of the road) so that you can find plant communities again when it is time to collect seed.

Always obtain permission from the landowner when collecting seed on private land. Never collect on public land.

Areas scheduled to be developed or where native plants will be destroyed in the future are excellent sites for seed collection. Avoid collecting seed from rare or endangered species. Collect only from plants that you find growing abundantly in a given area so that you will not eradicate an isolated population. Never collect seed from plants that have not been identified.

At the most, take only one-third of the seed to ensure that enough remains to reseed and increase the stand. Seeds traded commercially must number in the millions. Sellers grow seed for some species, and collect seed from native plant habitats for the rest. Ordinarily, seed collection is not likely to deplete a species, particularly if it is an annual. However, if a large proportion of the seed is collected from a site where there is a limited population of the species, or if the site is on the edge of its range and collection continues over a period of years, seed collection could deplete the population.

SEED MATURATION

Successful harvesting requires an understanding of seed ripening, dispersal mechanisms, and the weather's influence on the timing of seed maturation. Collectors must be familiar with approximate flowering and fruiting or seed. Experience is often the best teacher in learning to assess seed maturation. Since production of mature seed is weather-dependent, flowering and fruiting dates vary from year to year. For example, an early spring and dry summer may cause seed to set, or mature early. Seed quality also varies from year to year and from location to location. As a general rule, late August, September and October are the best months for collecting seed.

After you have determined the approximate time period in which the fruit or seed will ripen, the next step is careful observation. Collection should begin when fruit and seed are mature. A delay of only a few days can result in an unsuccessful harvest, especially of seeds that are dispersed quickly or are attractive to birds and other animals. Delayed harvesting, even of persistent pods, may also result in

insect - or mold-infested pods and seeds.

Many pods or capsules dehisce (break open and expel seed) when ripe and at staggered intervals, making collection difficult. Once maturation begins, these plants may need to be checked every few days for newly matured seed. Or you may invert a paper sack over the blooms and tie the sack off with a twist-tie. Enough light and air will reach the plant to allow it to continue growing, but the sack will collect the seeds as they mature and drop. This way, you will only need to collect seed once, at the end of the seed set.

Collect seeds as soon as they are mature. Mature seeds are usually dark in color, firm and dry. Seeds that are green and moist are immature and generally will not germinate, or will produce unhealthy seedlings. Legume pods should be collected just before or as the pod turns brown, and before it dehisces. The flesh of pulpy fruit often becomes soft and changes from green to yellow to red or blue-purple when ripe. Seeds are often mature a week or more before the fleshy fruit turns color and falls from the plant. Seed maturity can be determined by cutting open the fruit and examining the seed for firmness, fullness and dark color.

Gather fruit from the ground only if it has dropped recently. Fruit or seed that has been on moist ground for some time should be rejected because they probably will have begun to decay or become infested with insects. They could ruin the rest of the harvest if combined with other seed during storage. After the seeds are dried, clean them either by placing in a paper bag and vigorously shaking or by placing the seed on a piece of screen stretched on a frame and vigorously shaking.

SEED STORAGE

Once collected seeds should be air dried for three to five days in a cool dry spot. Seeds should never be stored where exposed to direct sunlight. The two most critical factors in seed storage are constant temperature and humidity. Ideally, both should be low: 50 degrees Fahrenheit or less for temperature and 50 percent or less for humidity. Fluctuating temperatures and humidity do more harm to seed than slightly higher, constant values of each. Store seed in paper sacks for optimum air circulation and to prevent molding. Do not store in plastic or other non porous containers. Some seeds may be viable after being stored for ten years, and others may fail to germinate after a second year of storage. Ideally, seeds should be planted within one year.

The History of Wildflowers

By Chy and Ray Allen, Founders, AmericanMeadows.com

The lovely flowering plants we all enjoy today were not around when our planet was much younger. In fact, how we arrived at the current botanical diversity we enjoy today is a fascinating story, and begins at the very beginning of time. Here's a layman's quick explanation of how it all happened.

Flowering plants are called *Angiosperms*. Their origins are still one of the great mysteries of evolution. Fossil records indicate they appeared suddenly on the planet about 80 to 90 million years ago, beginning their rapid diversification in the mid-Cretaceous epoch. Today *angiosperms* are the most abundant and diverse plants on the earth.

Originally, plants were generated from spores, not seeds. The spore process is called sporophyte generation. In this process two types of spores are produced: *microspores* whose cell structure germinate and develop into males and *megaspores* which develop into females. This divergent development itself is called *meiosis*. Plants evolved over time through sexual reproduction from these initial processes. In short, very early plants had all they needed to reproduce themselves. More advanced "flowering plants" did not. With their emergence, a whole new grand design was needed, and it required "outside help."

The birds and the bees. Because plants are, for the most part, stationary or "non-locomotive" (which means they stay in one place rather than roaming around like animals or insects), nature had to provide a mechanism whereby the male and female parts of newly-formed flowers could reach each other safely and successfully. This need resulted in the rise of the system of pollination or fertilization by birds and insects. Flowers evolved into the showy, colorful forms we know and love to attract these pollinators. Sweet nectar simply added to the allure. Now you know the origin of the phrase, "the birds and the bees".



Though they are not the original landscaping of the planet, the history of flowering plants is long. Archaeological evidence shows that early man knew of seeds 50,000 years ago, since their discovery in a cave in Northern Iraq. Excavations in the Nile Valley have shown the remains of 25 different plants, including cattails, dating to over 17,000 years ago. Chemical analysis done on Egyptian fabrics dating to 1370 BC show the presence of dyes extracted from plants of the *madder* family. Flower gardening scenes are depicted on the bedroom walls in the palace of Amenhotop IV circa 1380 BC, Ramses III is recorded as having imported and naturalized foreign plants: "Gardens of vines, of trees, fruits and flowers are around thy temple and before thy face."

The Greek and Roman contribution to horticulture began with Theophrastus (300 BC) who is today considered the "Father of Botany". A pupil of Aristotle, he was put in charge of the Athenian botanical gardens which resulted in his work, *De historia plantarum*, a compilation of observations regarding trunks, inner plant structures, roots, leaves and seeds. He described about 500 separate plants using

these criteria.

The Roman, Pliny (23 BC), studied ornamental and wild-growing plants based on their utility citing them as a source of food for both bees and man, as well as their potential medicinal uses. Even earlier, Virgil had described 164 plants including vetch and lupine in 50 BC. In 50 AD, the Greek, Dioscorides, known today as the “Father of Medicinal Botany” described 650 different species.

The Medieval Herbalists. While the early Middle Ages produced little in the way of scientific plant content, Christian monasteries did preserve the works of antiquity which was later expanded upon by the so-called Herbalists. In 1530 Jacob Brunfels published the *Herbarium Vical Eicones*. In 1542 Leonhart Fuchs wrote his famous herbal, *De Historia Stirpium*.



In 1597 John Gerard published his famous *Herbal of Generall Historie of Plants*. And in 1624 Gaspard Bauhin published his *Pinax Theatri Bonanici* which classified about 6,000 species including hundreds of wildflowers using the concept of *genus* and *species* later formalized by Linnaeus, the brilliant Swedish botanist who organized it all.

[Click here to read “How Wildflowers Got Their Names”](#) which explains the naming system we use today, organized by Linnaeus.

The 17th through 19th centuries saw the rapid expansion of botany which was consistent with a period of exploration and scientific development. The 1700’s witnessed the classification system of Linnaeus, and exchanges of plant specimens from the Americas to Europe through the travels of now-famous plant explorers such as Mark Catesby, who like many others, created exquisite drawings of the plants (and animals) he encountered. In the 1800’s

Lewis and Clark traveled the North American continent carefully noting its wild flora while Charles Darwin collected an enormous number of plants and published his *Origin of the Species* in 1859. Gregor Mendel introduced the science of genetics in 1866. Many of these botanical pioneers, including Lewis, Clark, and Darwin have their names immortalized in the botanical names of plants today.

The modern English/American fascination with wildflowers as garden subjects really began in England with a few 19th Century gentlemen and gentlewomen, the most famous of which was surely Vita Sackville-West. These privileged people, quite accustomed to formalized flower beds tended by staffs of servants, became more and more interested in “natural” gardens, and the flowers that went with them. Gertrude Jekyll, the most famous English garden writer of the time, began cultivating what she called “flowering incidents” in her woodland and meadows. In involved either encouraging wildflowers she found “in situ”, or creating new colonies by planting them in a naturalized manner.

Today’s wildflower seed mixtures and the fascination with wildflower gardening is directly descended from these early English gardening innovators who recognized the flowers of the wild as perhaps the most wonderful and beautiful flowers of them all.

WILDFLOWER SEED SOURCES

Listed below are companies that sell wildflower seed. You may call or write to them to request a seed catalog.

ADAMS BRISCO SEED CO., INC.

P.O. Box 19
Jackson, GA 30233-0019
Phone: (770) 775-7826
FAX: (770) 775-7122
E-MAIL:
webstie: ABSEEDJUNO.COM

WILDSEED FARMS, INC.

P.O. Box 308
Eagle Texas 77434
Phone: (800) 848-0078
FAX: (409) 234-7407
EMAIL: orders1@wildseedfarms.com
Webste: Wildseedfarms.com mikw

AMERICAN MEADOWS, INC.

FORMERLY VERMONT WILDFLOWER FARM
223 Avenue D, Suite 30
Williston, VT 05495
Phone: (802) 951-5812
FAX: (802) 951-9089
E-MAIL: mike@americanmeadows.com
Webstie: americanmeadows.com

ERNST CONSERVATION SEEDS

9006 Mercer Pike
Meadville, PA 16335
Phone: (814) 336-2404
FAX: (814) 336-5191
E-MAIL: Ernst@ernstseed.com
Website: ernstseed.com

LOFTS SEED

4764 Hollins Ferry Road
Baltimore, MD 21227
Phone: (800) 732-3332
FAX: (410) 247-2037
Website: turf.com

SHOOTING STAR NURSERY

444 Bates Road
Frankfort, KY 40601
(502) 223-1679
website: shootingstarnursery.com

REFERENCE BOOKS

WILDFLOWER HANDBOOK

National Wildflower Research Center
2600 FM 973 North
Austin, TX 78725
Phone: (512) 929-3600
Website: wildflower.org

THE WILDFLOWER MEADOW BOOK

AMERICAN MEADOWS, INC.

FORMERLY VERMONT WILDFLOWER FARM
223 Avenue D, Suite 30
Williston, VT 05495
Phone: (802) 951-5812
FAX: (802) 951-9089
E-MAIL:
Webstie: americanmeadows.com

Illegal to Pick Wildflowers

WV Law 31-3-48

- (a) It is unlawful to break, cut, take, or carry away, or in any manner damage any of the shrubbery or flowers, including everything under the title of flora, whether wild or cultivated, growing within one hundred yards on either side of any public road in this state, without the permission in writing of the owner or tenant of the land upon which the shrubbery or flowers, including everything under the title of flora are growing.

- (c) It is unlawful to break, cut, take, or carry away, or in any manner damage any of the shrubbery or flowers, including everything under the title of flora, whether wild or cultivated, growing within one hundred yards on either side of any public road in this state, without the permission in writing of the owner or tenant of the land upon which the shrubbery or flowers, including everything under the title of flora are growing.